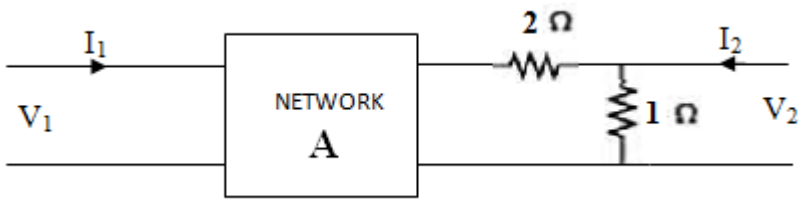
Unit-III

TWO PORT NETWORKS

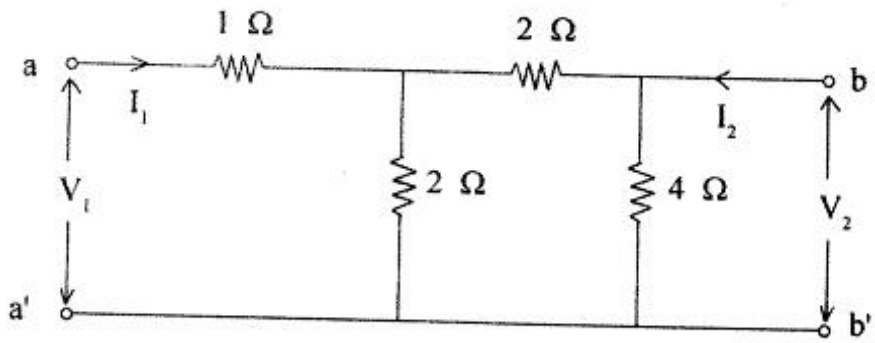
Assignment-3

1. a) Derive the relation between 'Impedance' and Admittance parameters.
   b) The Z – parameters of two port network are Z_{11} = 10 ohms, Z_{22} = 20 ohms, $Z_{12} = Z_{21}$ = 5 ohms find the hybrid parameters of the network and equivalent T-network.
2. a) The Y- parameters of a two port network are Y_{11} = 0.6 mho, Y_{22} = 1.2 mho and $Y_{12}=Y_{21}$= 0.6 mho. Determine the ABCD parameters.
   b) Deduce the relation between Y and Z parameters & Y and h parameters.
3. a) In the arrangement of figure given below



If = Then find A, B, C, D parameters of network-A.

   b) **Develop** necessary expression for Y parameters in terms of Z parameters.
4. a) **Find** Y parameters for the network



   b) Show that when two 2-port networks N1 and N2 are connected in parallel the equivalent Y-parameters of the combined network is the sum of Y-parameters of each individual 2-port network
5. a) The Z-parameters for a two-port network are: Z_{11} = 25Ω, Z_{22} = 40Ω, $Z_{12} = Z_{21}$ = 20Ω. Calculate the h- and ABCD-parameters of the network. Also find its equivalent T-network.
   b) Find the transmission parameters of the network shown in Fig.3.

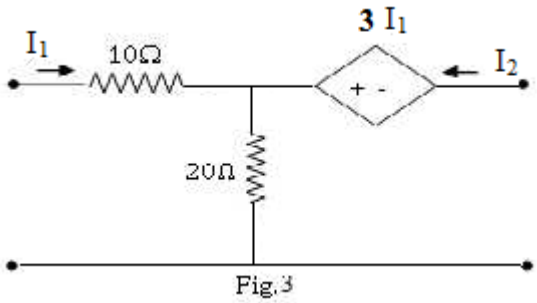


Fig.3

6. a) State and explain Hybrid parameters.

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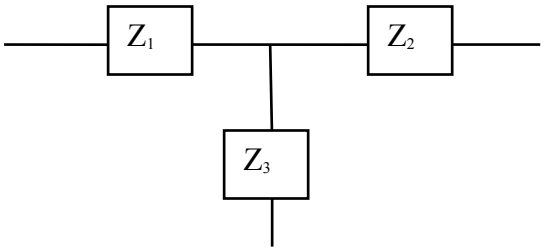
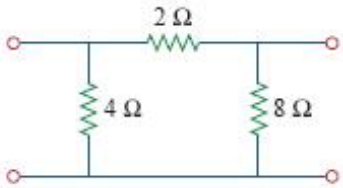
7. b) A two port network has Y parameters $Y_{11} = 10$ $Y_{12} = -5$, $Y_{21} = -20$, and $Y_{22} = 2$, all in milli mhos. Find Y parameter if a 100 ohms resistor is connected i) across the input ii) across the output.
8. In a T network shown $Z_1 = 26 \angle 0^0$, $Z_2 = 56 \angle 90^0$, $Z_3 = 36 \angle 90^0$ Find the Z parameter

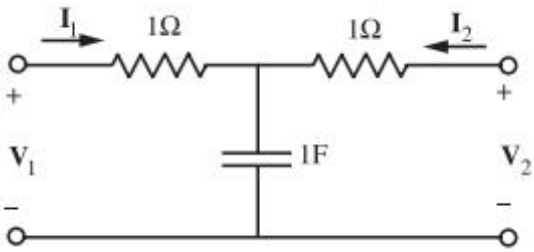


9. b) Z- parameters for a two port network are given as $Z_{11} = 25\ \Omega$, $Z_{12} = Z_{21} = 20\ \Omega$ and $Z_{22} = 50\ \Omega$. Find the equivalent T-network.
10. a) Find Short circuit Admittance parameters for the circuit shown below.

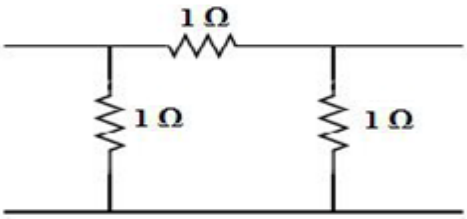


b) Write symmetry and reciprocity condition for open circuit, short circuit, hybrid and ABCD parameters.

11. a) Express impedance parameters in terms of admittance parameters.
b) Determine the transmission parameters in the s domain for the following two port network



12. a) Derive Z-Parameters in terms of ABCD-Parameters
b) Obtain y-parameters for the given network



13. a) Derive the condition of reciprocity & symmetry for y- parameters
b) Explain ABCD-Parameter model of a passive two port network. Mention its

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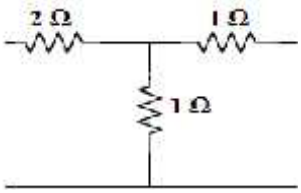
applications

14. a) Obtain z- parameters for the given network



b) Derive Y-Parameters in terms of individual Y-Parameters of two two-port networks when they are parallel connected

15. a) Obtain the Y-Parameters of a passive network whose Admittances are Y_A,Y_B and Y_C, where Y_c appears in series branch
b) Find ABCD parameters for cascade network

16. a) Find necessary expressions for Y parameters in terms of Z parameters.
b) Two 2 port networks are connected in cascaded find the equivalent Z parameters

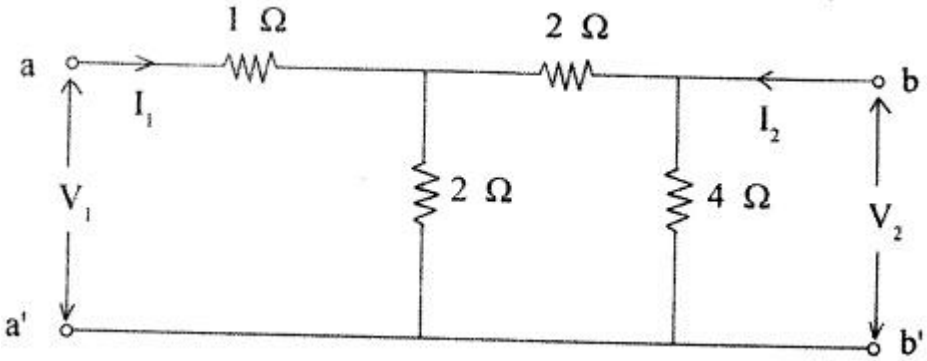
17. a) The h-parameters of a two port network are $h_{11} = 6\Omega$, $h_{22} = 3\mho$, $h_{12} = h_{21} = 5$. Determine the ABCD parameters.
b) Show and find the condition of reciprocity & symmetry for z- parameters.

18. a) Recall the necessary expressions for Y parameters in terms of Z parameters.
b) Two 2 port networks Y1 and Y2 are connected in parallel find the equivalent Y parameters

19. a) The Z parameters are **Z_{11}=4Ω.Z_{12} =6.Z_{21}=3.Z_{22}=8,** find A.B.C ,D parameters.
b) Recall the condition of reciprocity and symmetry for y parameters.

20. a) Discuss relation of z parameters and ABCD parameters
b) Appraise the importance of cascaded connection of two port networks

21. a) Deduce y parameters of the network shown.



b) When two 2 port networks N1 and N2 are connected in parallel, relate equivalent parameters of combined network in terms of y parameters of individual networks.